

## **ABSTRACT OF THE DISCLOSURE**

A method for manufacturing magnetic field detection devices is described, said method comprising the operations of manufacturing a magneto-resistive element (10; 20) comprising regions with metallic conduction (13; 23) and regions with semi-conductive conduction (11; 31). Said method comprises the following operations: - forming metallic nano-particles (37) to obtain said regions with metallic conduction (13; 23); - providing a semiconductor substrate (31); - applying said metallic nano-particles (37) to said semiconductor substrate (31) to obtain a disordered mesoscopic structure. A magnetic device is also described, comprising a spin valve, said spin valve (110) comprising a plurality of layers (111, 112, 113, 114, 115, 116, 117) arranged in a stack which in turn comprises at least one free magnetic layer (111) able to be associated to a temporary magnetisation (MT), a spacer layer (133) and a permanent magnetic layer (112) associated to a permanent magnetisation (MP). The spacer element (133) is obtained by means of a mesoscopic structure of nanoparticles in a metallic matrix produced in accordance with the method for manufacturing magnetoresistive elements of the invention.